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Claims

1. A method of detecting a plurality of different target nucleotide sequences present in a single sample, wherein said target sequences are detected at the same, or substantially the same, time and the method of detecting each nucleotide sequence in a nucleic acid molecule comprises:

(a) binding of an oligonucleotide probe to said nucleic acid molecule;

(b) selective labelling of the bound oligonucleotide probe in the presence of said target nucleotide sequence;

(c) hybridisation of the labelled oligonucleotide to a complementary sequence; and

(d) subsequent detection of the label.

2. A method as claimed in claim 1 wherein the complementary sequence of (c) is fully complementary to the oligonucleotide probe.

3. A method as claimed in claim 1 or claim 2 wherein the oligonucleotide probe is 20 to 30 nucleotides in length.

4. A method as claimed in any of the preceding claims wherein the oligonucleotide probe is labelled by incorporation of a labelled nucleotide.

5. A method as claimed in claim 4 wherein the labelled nucleotide is a labelled dideoxynucleotide.

6. A method as claimed in claim 4 or 5 wherein selective labelling takes place in the presence of one or more labelled dideoxynucleotides and one or more unlabelled dideoxynucleotides.

7. A method as claimed in claim 6 wherein selective labelling takes place in the presence of one labelled dideoxynucleotide and three unlabelled dideoxynucleotides.

8. A method as claimed in any of the preceding claims wherein the oligonucleotide probe is designed with one or more mismatches at the 3'-end to non-target nucleotide sequences.

9. A method as claimed in any one of the preceding claims wherein a plurality of labelling steps are performed consecutively.

10. A method as claimed in any of the preceding claims wherein the sequence complementary to the labelled oligonucleotide is immobilised on a solid support.

11. A method as claimed in claim 10 wherein the solid support is a membrane strip or nucleic acid chip.

12. A method as claimed in any of the preceding claims wherein steps (a) to (d) are preceded by amplification of the nucleic acid molecule which contains the target sequence.

13. A method as claimed in claim 12 wherein the nucleic acid molecule which contains the target sequence is co-amplified with a competitor nucleic acid molecule.

14. A method as claimed in claim 13 wherein the competitor molecule comprises a recognition sequence which is complementary to a competitor oligonucleotide probe.

15. A method as claimed in claim 14 wherein the competitor oligonucleotide probe is selectively labelled

after hybridisation to the competitor molecule.

16. A method as claimed in claim 15 which additionally comprises hybridisation of the labelled competitor oligonucleotide to a complementary sequence and subsequent detection of the label.

17. A method as claimed in any of the preceding claims wherein the sequences which are complementary to the oligonucleotide probes are immobilised on a solid support in discrete, pre-determined positions.

18. A method of determining the amount of a target nucleotide sequence or the number of cells containing a target nucleotide sequence, which comprises a detection method as claimed in any one of claims 1 to 17.

19. A method of detecting the presence of bacteria in a sample which comprises a method as claimed in any one of claims 1 to 17.

20. A method as claimed in claim 19 wherein the bacteria are cyanobacteria.

21. A kit, for carrying out a method as claimed in any of the preceding claims which comprises:

(a) oligonucleotide probes capable of binding to target nucleic acid molecules containing target nucleotide sequences;

(b) means for selective labelling of the oligonucleotide probes; and

(c) nucleotide sequences complementary to the oligonucleotide probes, preferably immobilised on a solid support.